FIG. 1

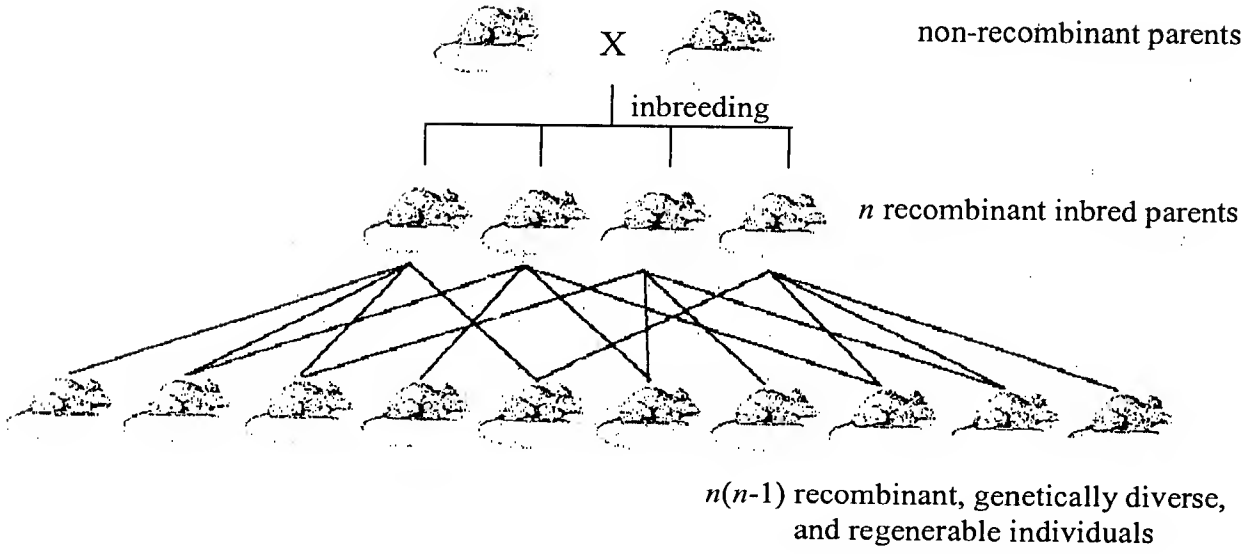


FIG. 2

$$y = a + bx + \sum b_i x_i + N(0,e)$$

y = trait value of individual
a = mean trait value of population
b = gene strength or allele substitution effect
x = genotype
bx = effect of target gene on trait value

Term describing genetic noise
(reduce by using more genetically diverse lines)

Term describing environmental noise
(reduce by using more genetically identical lines)

Mapping populations	Term describing genetic noise	Term describing environmental noise
RI (recombinant inbred)	poor	excellent
F2 (F1 intercross)	excellent	poor
RIX (RI intercrosses)	excellent	excellent

FIG. 3

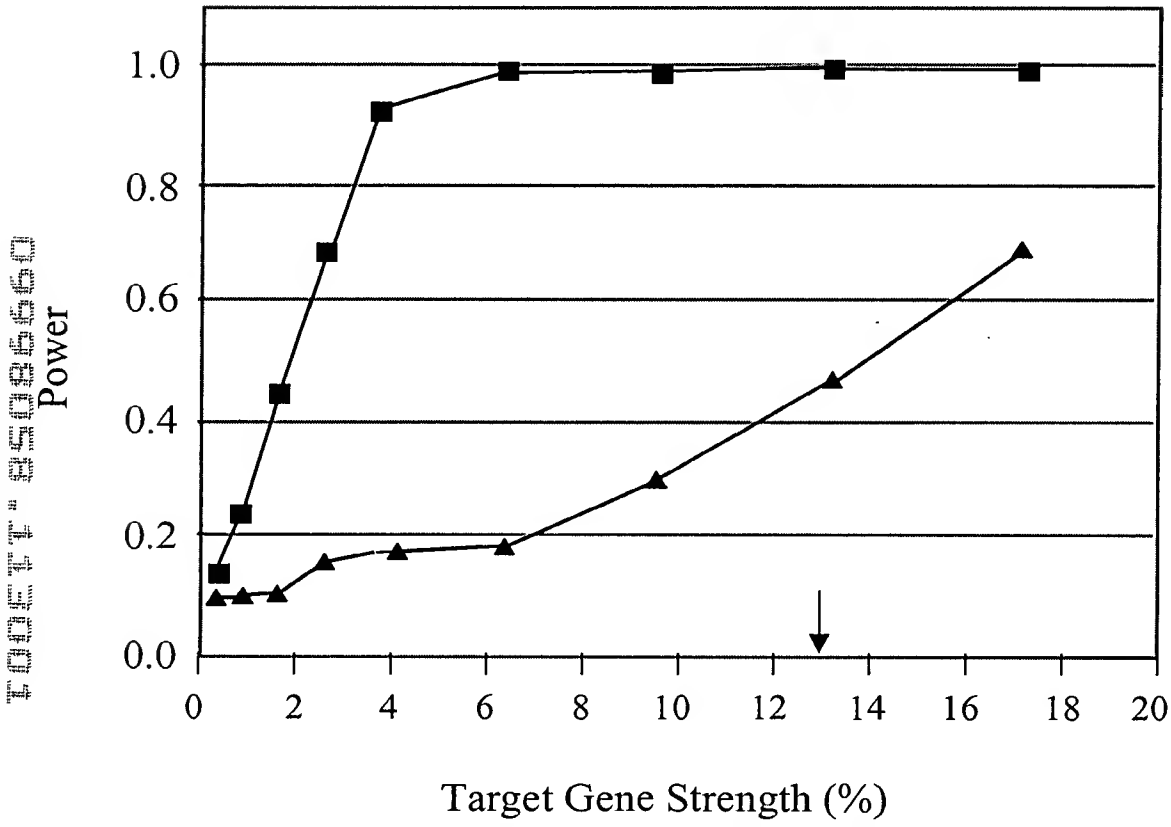
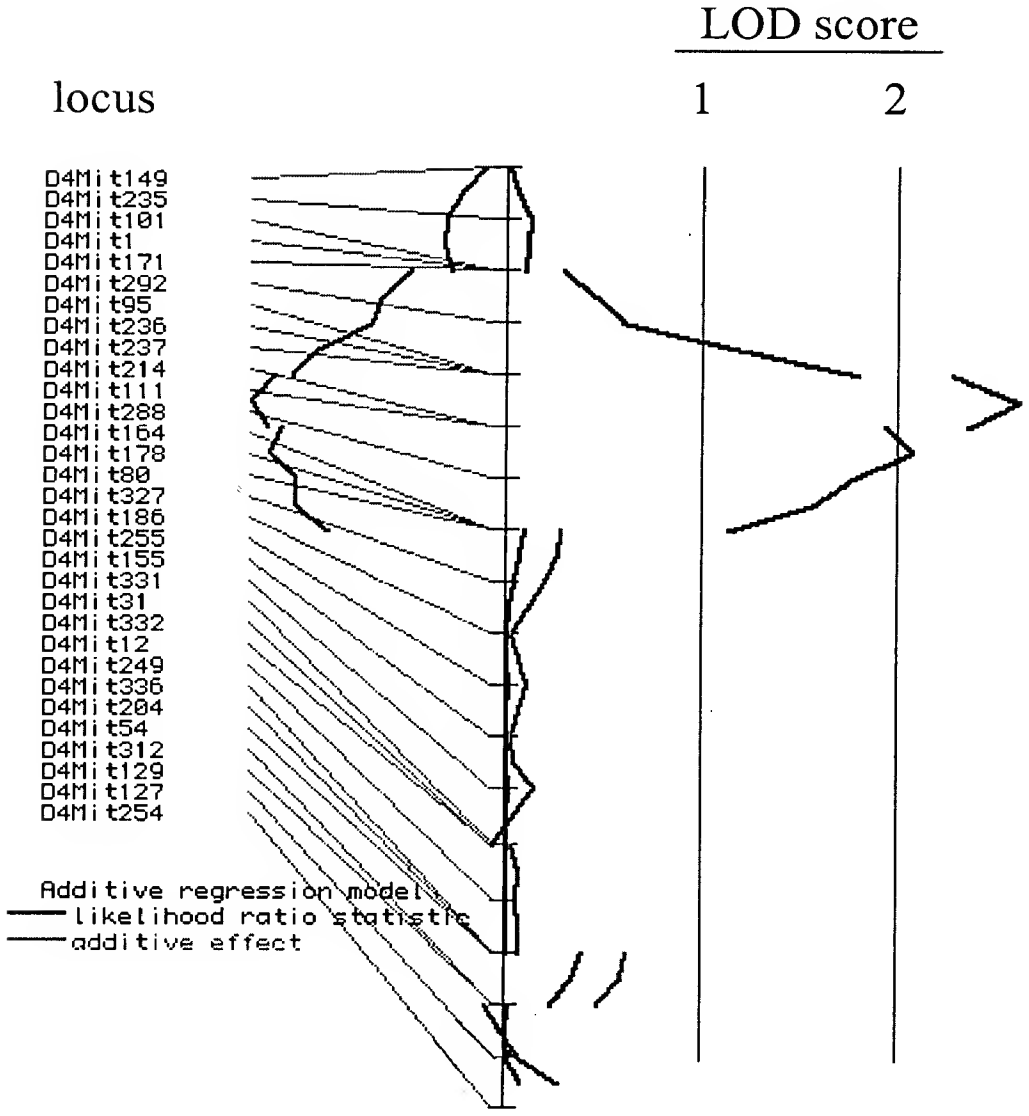

Power
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
14
16
18
20
Target Gene Strength (%)

FIG. 4

Mother \ Father	CXB1	CXB2	CXB3	CXB4	CXB5	CXB6	CXB7	CXB8	CXB9	CXB10	CXB11	CXB12	CXB13
					BALB/cByJ 25		CB6ByF1 15			C57BL/6ByJ 27			
CXB1	28	26	8	15	8	22	13	11	18	16	15	12	24
CXB2	14	40	23	20	5	17	18	12	16	14	32	7	22
CXB3			45	26	22	22	5	33	15	21	9	24	13
CXB4	50	38		36	18	25	14	15	30	34	41	16	42
CXB5	6				27	6	18	19	29	2	18	13	3
CXB6						66	17	21	16		20	25	25
CXB7				26			89	26	23	12	15	2	8
CXB8								43	28	20	11	29	21
CXB9									47	35	28	23	20
CXB10										47	35	4	18
CXB11										11	51	18	22
CXB12										11		39	16
CXB13									4				62

FIG. 5


LOD score
locus
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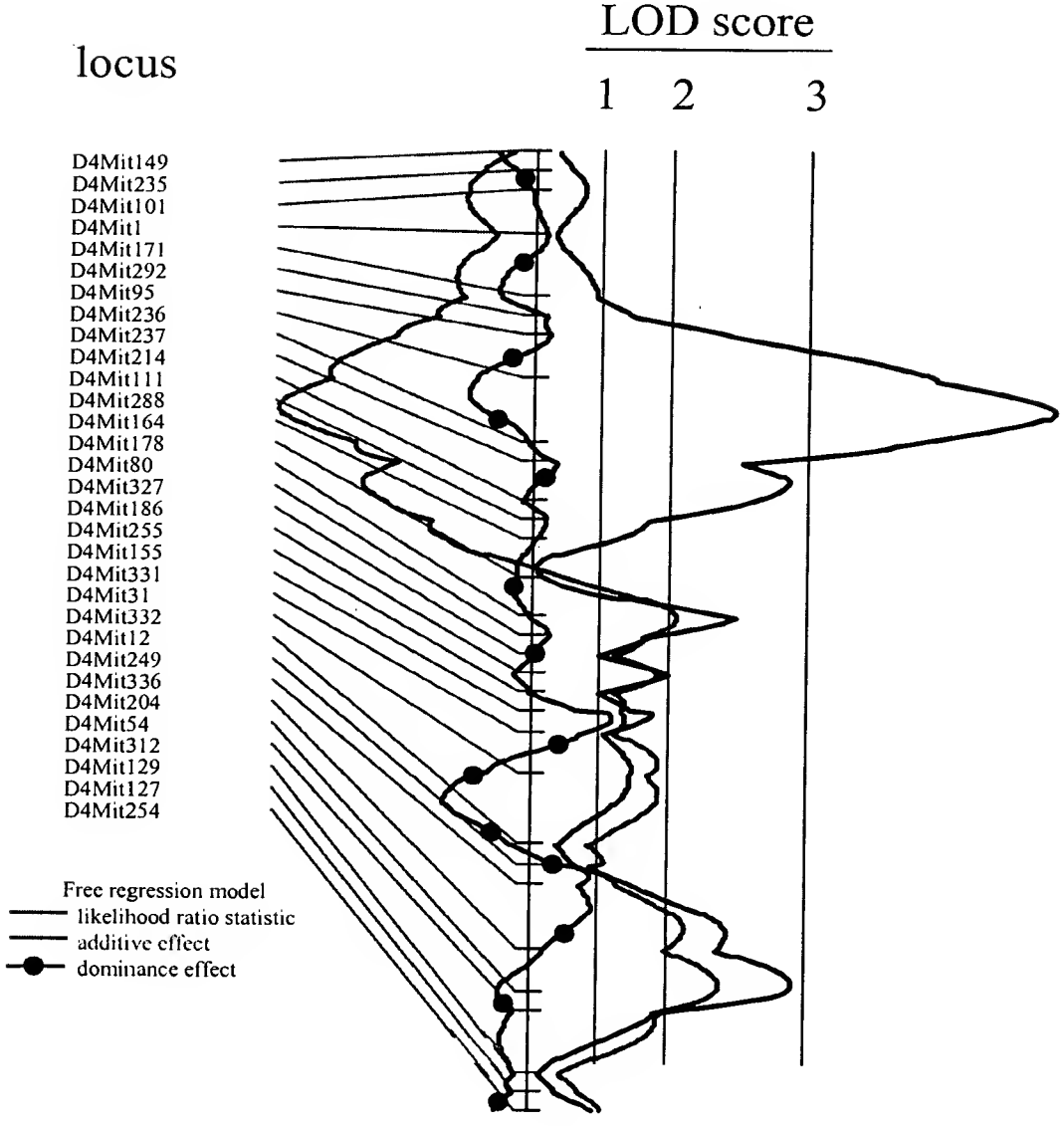
2
D4Mit149
D4Mit235
D4Mit101
D4Mit1
D4Mit171
D4Mit292
D4Mit95
D4Mit236
D4Mit237
D4Mit214
D4Mit111
D4Mit288
D4Mit164
D4Mit178
D4Mit80
D4Mit327
D4Mit186
D4Mit255
D4Mit155
D4Mit331
D4Mit31
D4Mit332
D4Mit12
D4Mit249
D4Mit336
D4Mit204
D4Mit54
D4Mit312
D4Mit129
D4Mit127
D4Mit254
Additive regression model
likelihood ratio statistic
additive effect

FIG. 6A


LOD score
locus
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2
3
D4Mit149
D4Mit235
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D4Mit1
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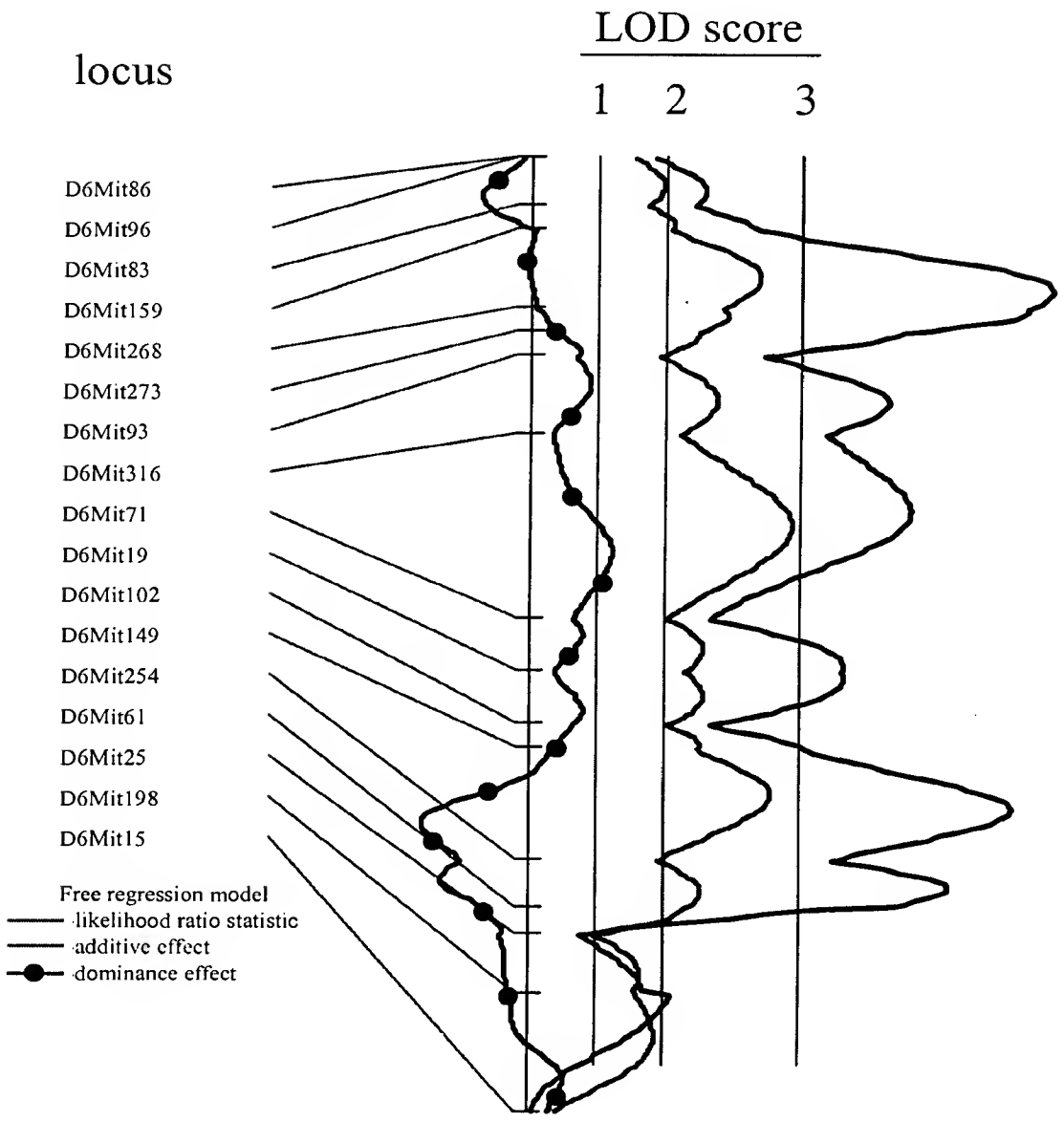
D4Mit292
D4Mit95
D4Mit236
D4Mit237
D4Mit214
D4Mit111
D4Mit288
D4Mit164
D4Mit178
D4Mit80
D4Mit327
D4Mit186
D4Mit255
D4Mit155
D4Mit331
D4Mit31
D4Mit332
D4Mit12
D4Mit249
D4Mit336
D4Mit204
D4Mit54
D4Mit312
D4Mit129
D4Mit127
D4Mit254
Free regression model
likelihood ratio statistic
additive effect
dominance effect

FIG. 6B


LOD score
locus
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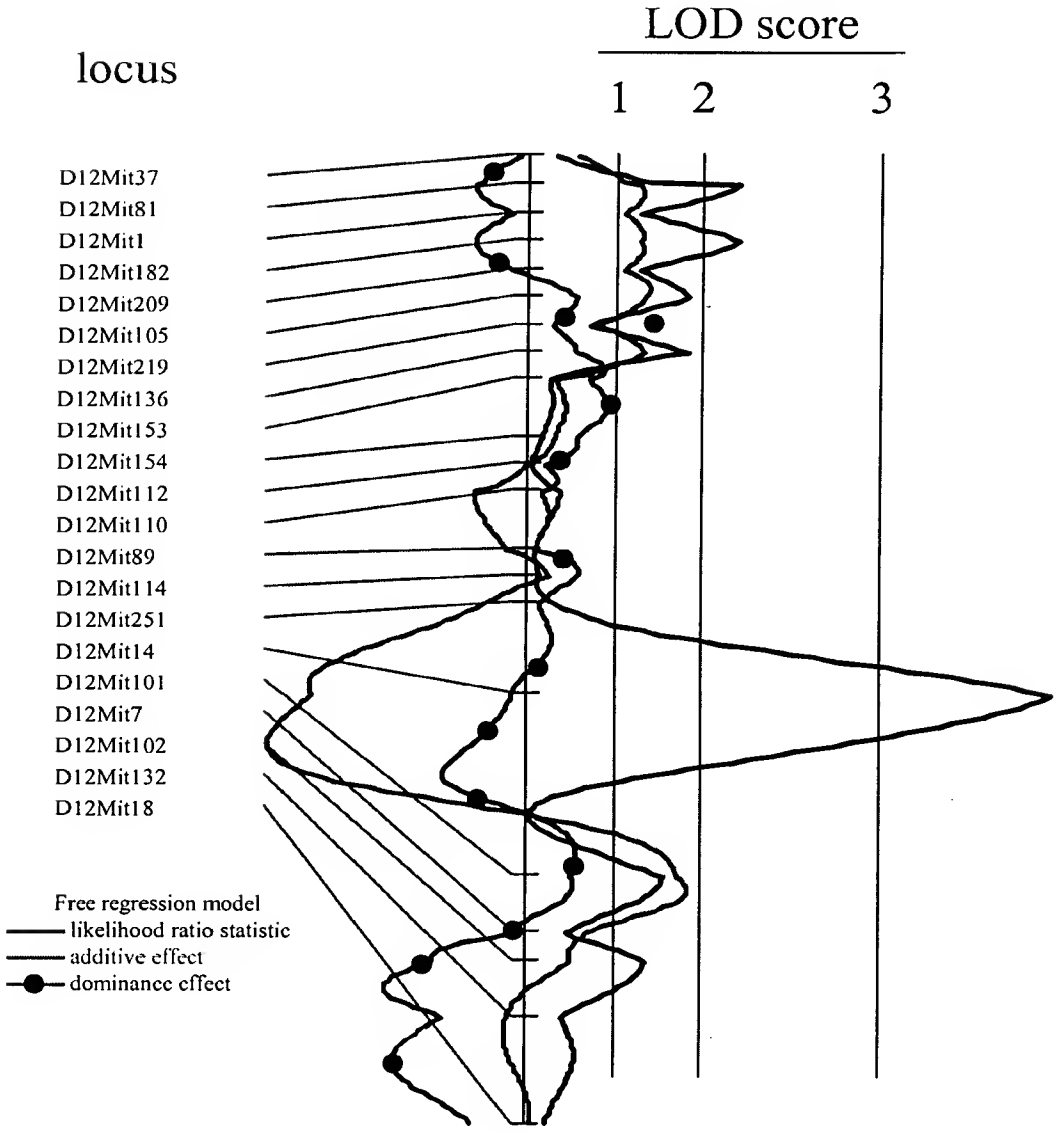
2
3
D6Mit86
D6Mit96
D6Mit83
D6Mit159
D6Mit268
D6Mit273
D6Mit93
D6Mit316
D6Mit71
D6Mit19
D6Mit102
D6Mit149
D6Mit254
D6Mit61
D6Mit25
D6Mit198
D6Mit15
Free regression model
likelihood ratio statistic
additive effect
dominance effect

FIG. 6C


LOD score
locus
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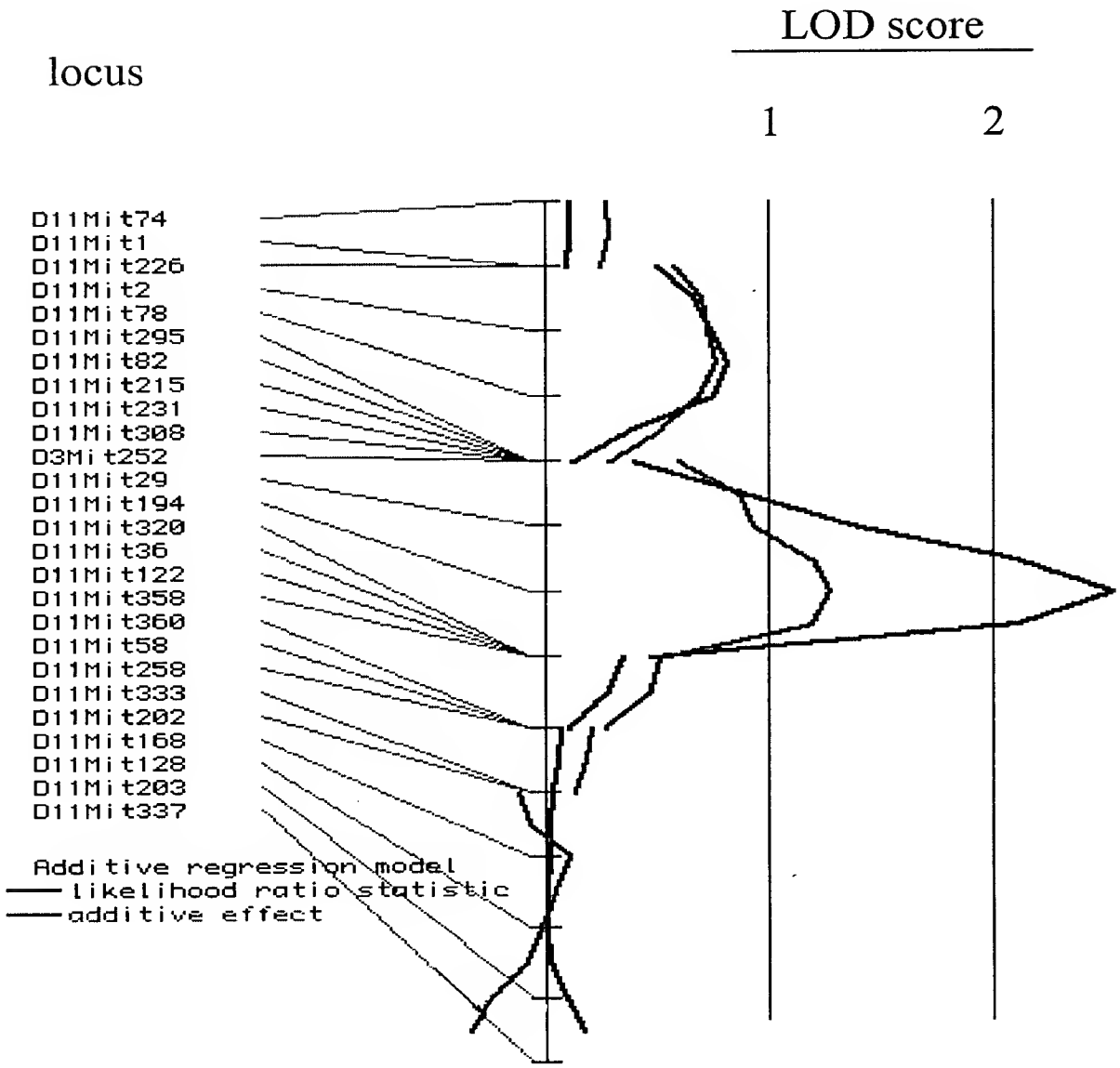
2
3
D12Mit37
D12Mit81
D12Mit1
D12Mit182
D12Mit209
D12Mit105
D12Mit219
D12Mit136
D12Mit153
D12Mit154
D12Mit112
D12Mit110
D12Mit89
D12Mit114
D12Mit251
D12Mit14
D12Mit101
D12Mit7
D12Mit102
D12Mit132
D12Mit18
Free regression model
likelihood ratio statistic
additive effect
dominance effect

FIG. 7


LOD score
locus
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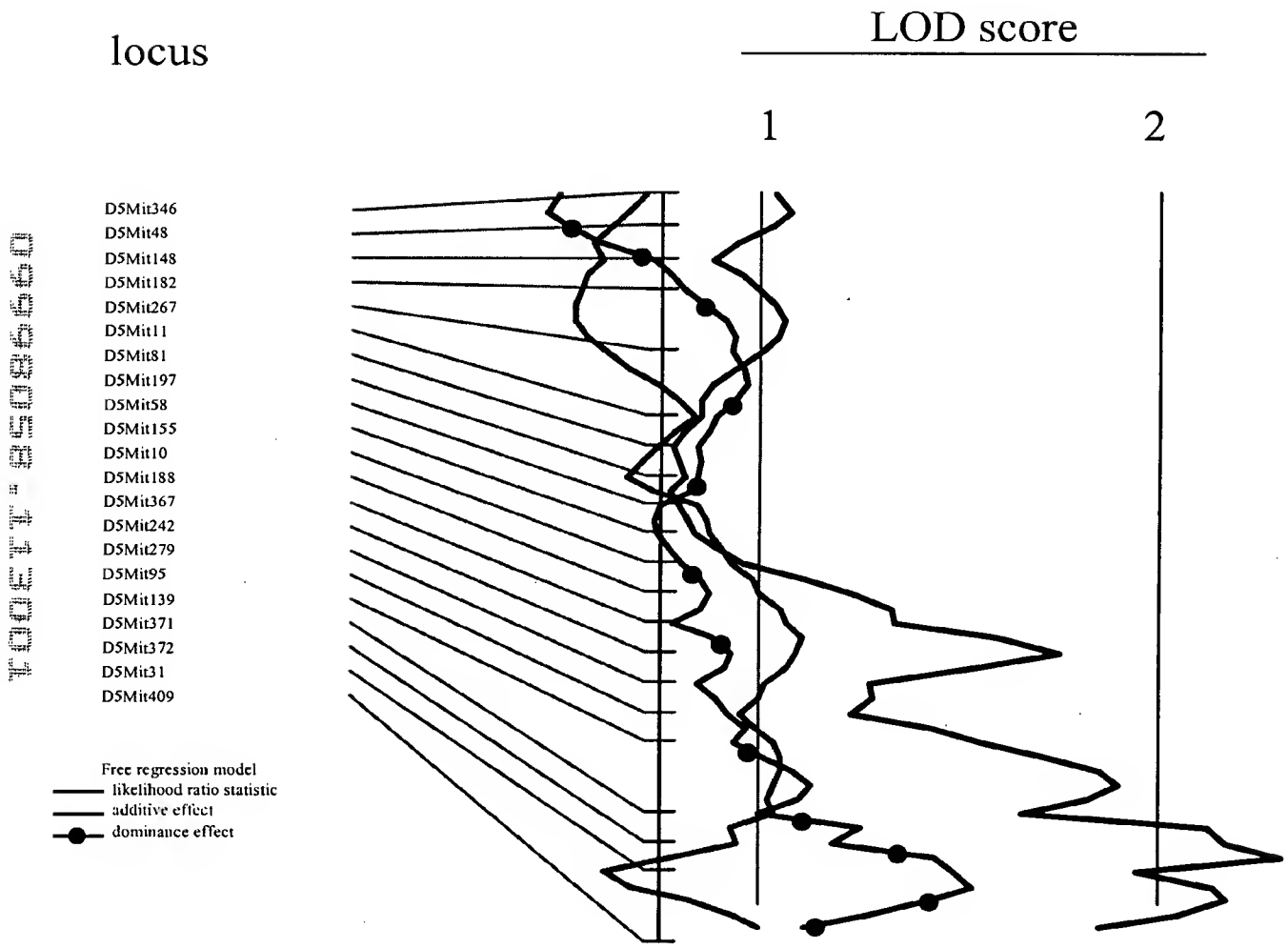
D11Mit1
D11Mit226
D11Mit2
D11Mit78
D11Mit295
D11Mit82
D11Mit215
D11Mit231
D11Mit308
D3Mit252
D11Mit29
D11Mit194
D11Mit320
D11Mit36
D11Mit122
D11Mit358
D11Mit360
D11Mit58
D11Mit258
D11Mit333
D11Mit202
D11Mit168
D11Mit128
D11Mit203
D11Mit337
Additive regression model
likelihood ratio statistic
additive effect

FIG. 8A


locus
LOD score
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D5Mit346
D5Mit48
D5Mit148
D5Mit182
D5Mit267
D5Mit11
D5Mit81
D5Mit197
D5Mit58
D5Mit155
D5Mit10
D5Mit188
D5Mit367
D5Mit242
D5Mit279
D5Mit95
D5Mit139
D5Mit371
D5Mit372
D5Mit31
D5Mit409
Free regression model
likelihood ratio statistic
additive effect
dominance effect

FIG. 8B

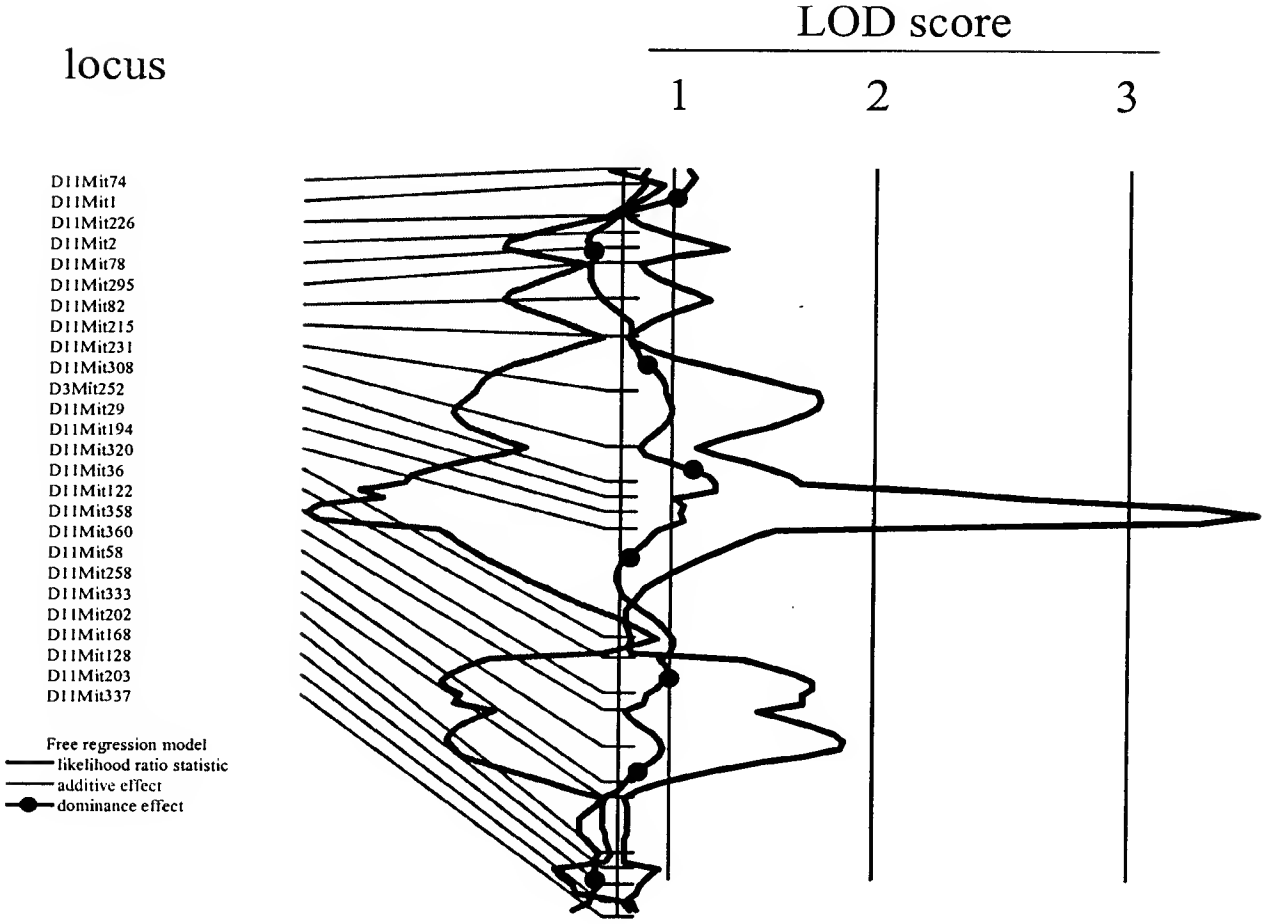
locus
LOD score
1
2
3
D11Mit74
D11Mit1
D11Mit226
D11Mit2
D11Mit78
D11Mit295
D11Mit82
D11Mit215
D11Mit231
D11Mit308
D3Mit252
D11Mit29
D11Mit194
D11Mit320
D11Mit36
D11Mit122
D11Mit358
D11Mit360
D11Mit58
D11Mit258
D11Mit333
D11Mit202
D11Mit168
D11Mit128
D11Mit203
D11Mit337
Free regression model
likelihood ratio statistic
additive effect
dominance effect

FIG. 9

C57BL/6ByJ 28.4   BALB/cByJ 25.6

Mom \ Dad	CXB1	CXB2	CXB3	CXB4	CXB5	CXB6	CXB7	CXB8	CXB9	CXB10	CXB11	CXB12	CXB13
CXB1	29.6	29.1	30.1	30.5	29.0	28.8		30.9	30.0	29.6	29.5	30.5	29.2
CXB2	27.0	27.8	27.1	27.5	28.2	27.1	26.0	28.1	27.8	28.4	29.0	28.3	26.2
CXB3			26.6	28.2	27.8	29.5		27.5	28.6	28.3	29.7	30.0	28.1
CXB4	28.8	28.9		28.5	27.8	27.7	29.8	30.1	29.5	31.0	29.3	31.6	27.7
CXB5					24.6	27.0	28.9	27.5		27.9	27.6	29.0	28.5
CXB6						27.4	27.8	27.7	27.7		28.0	27.2	26.2
CXB7				28.5			29.9	28.5	31.0	29.2		30.8	29.3
CXB8								28.0	29.2	28.3	28.5	29.5	26.7
CXB9									27.9	31.3	29.1	28.[illegible]	27.1
CXB10										27.9	28.5		28.7
CXB11										29.5	28.1	29.3	28.1
CXB12												28.9	28.3
CXB13									25.7				24.4